TYPE APPROVAL CERTIFICATE

Certificate no.:
TAE000017N
Revision No:
2

This is to certify:

that the Generator

with type designation(s)
ECO38, -40, -43, -46 and ECP32, -34, 3 phases, 4 poles, single or double bearings, brushless A.C. generator.

issued to
Mecc Alte S.p.A.
Creazzo, VI, Italy

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Degree of protection	**IP 23(IP45)**
Insulation class	**H**
Temp. class (°C)	**B, F or H**
Voltage (V)	**Up to 690 V (star connection)**
Power (kW)	**Up to 3226 kVA**
Frequency (Hz)	**50 or 60 Hz**
Speed (RPM)	**1500 or 1800 RPM**

Issued at **Høvik** on **2024-07-12**

This Certificate is valid until **2029-07-11**.
DNV local unit: **Italy/Malta CMC**

Approval Engineer: **Andreas Andrecht**

for **DNV**
Digitally Signed By: Sjåvåg, Trond Kleivi
Location: DNV Høvik, Norway

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product Description

ECO38, -40, -43, -46 and ECP32, -34, 3 phases, 4 poles, single or double bearings, brushless A.C. generator.

Enclosure class:	IP 23 or IP 45
Winding insulation:	Class H
Temperature rise limits:	Class B, F or H
Voltage class:	Up to 690 V (star connection)
Power class:	Up to 3226 kVA
Frequency class:	50 or 60 Hz
Speed:	1500 or 1800 RPM

Rating class H: [kVA] Amb 45°C								
	50 Hz			**60 Hz**				
Type	**380 V**	**400 V**	**415 V**	**440 V**	**450 V**	**460 V**	**480 V**	**690 V**
ECP32-1S4C	36	36	36	41,3	42,3	43,2	43,2	43,2
ECP32-2S4C	43,2	43,2	40,3	48	49,9	51,8	51,8	51,8
ECP32-1M4C	48	48	48	57,6	57,6	57,6	57,6	57,6
ECP32-2M4C	60	60	60	69,6	70,8	72	72	72
ECP32-1L4C	72	72	72	78,7	82,6	86,4	86,4	86,4
ECP32-2L4C	79,2	79,2	79,2	92,2	94,1	96	96	96
ECP34-1S4C	84	84	84	101	101	101	101	101
ECP34-2S4C	96	96	96	115	115	115	115	115
ECP34-1M4C	120	120	120	134	139	144	144	144
ECP34-2M4C	130	130	130	144	150	156	156	156
ECP34-1L4C	144	144	144	163	168	173	173	173
ECP34-2L4C	154	158	158	183	187	190	190	190
ECO38-1S4C	173	173	173	211	211	211	211	211
ECO38-2S4C	192	192	192	230	230	230	230	230
ECO38-1M4C	216	216	216	259	259	259	259	259
ECO38-2M4C	240	240	240	288	288	288	288	288
ECO38-1L4C	288	288	288	326	336	346	346	346
ECO38-2L4C	336	336	336	403	403	403	403	403
ECO38-VL4C	346	355	355	413	413	413	422	422
ECO40-1S4C	384	384	384	432	446	461	461	461
ECO40-2S4C	432	432	432	490	504	518	518	518
ECO40-3S4C	480	480	480	557	566	576	576	576
ECO40-1L4C	528	528	518	605	619	634	634	634
ECO40-2L4C	600	600	600	677	699	720	720	720
ECO40-3L4C	653	653	653	749	766	783	783	783
ECO40-VL4C	720	720	720	864	864	864	864	864
ECO43-1S4A	768	768	768	922	922	922	922	922
ECO43-2S4A	893	893	893	1018	1044	1071	1071	1071
ECO43-1M4A	984	984	984	1181	1181	1181	1181	1181
ECO43-2M4A	1104	1104	1008	1248	1296	1344	1344	1344
ECO43-2L4A	1248	1248	1248	1423	1460	1498	1498	1498
ECO43-VL4A	1344	1344	1344	1613	1613	1613	1613	1613
ECO46-1S4A	1440	1440	1440	1650	1690	1730	1730	1730
ECO46-1.5S4A	1584	1584	1584	1804	1852	1900	1900	1900
ECO46-2S4A	1730	1730	1730	1970	2020	2080	2080	2080
ECO46-1L4A	2016	2016	2016	2300	2360	2420	2420	2420
ECO46-1.5L4A	2208	2208	2208	2515	2580	2650	2650	2650

Rating class H: [kVA] Amb 45°C								
	50 Hz			60 Hz				
Type	**380 V**	**400 V**	**415 V**	**440 V**	**450 V**	**460 V**	**480 V**	**690 V**
ECO46-2L4A	2400	2400	2400	2730	2800	2880	2880	2880
ECO46-VL4A	2592	2688	2592	2956	3043	3131	3226	3226

Rating class F: [kVA] Amb 45°C								
	50 Hz			60 Hz				
Type	**380 V**	**400 V**	**415 V**	**440 V**	**450 V**	**460 V**	**480 V**	**690 V**
ECP32-1S4C	33,6	33,6	33,6	39,4	40,4	41,3	41,3	41,3
ECP32-2S4C	39,4	39,4	37,4	46,1	48	49,9	49,9	49,9
ECP32-1M4C	46,1	46,1	46,1	55,7	55,7	55,7	55,7	55,7
ECP32-2M4C	57,1	57,1	57,1	67,2	67,9	68,6	68,6	68,6
ECP32-1L4C	64,3	64,3	64,3	76,8	78,3	79,7	79,7	79,7
ECP32-2L4C	70,3	70,3	70,3	85,4	86,9	88,3	88,3	88,3
ECP34-1S4C	75,8	75,8	75,8	91,2	91,2	91,2	91,2	91,2
ECP34-2S4C	86,4	86,4	86,4	105	105	105	105	105
ECP34-1M4C	108	108	108	120	125	130	130	130
ECP34-2M4C	116	116	116	130	135	140	140	140
ECP34-1L4C	131	131	131	144	150	156	156	156
ECP34-2L4C	138	143	143	158	165	171	171	171
ECO38-1S4C	163	163	163	197	197	197	197	197
ECO38-2S4C	178	178	178	211	211	211	211	211
ECO38-1M4C	199	199	199	240	240	240	240	240
ECO38-2M4C	221	221	221	269	269	269	269	269
ECO38-1L4C	264	264	264	298	307	317	317	317
ECO38-2L4C	307	307	307	370	370	370	370	370
ECO38-VL4C	316	324	324	378	378	378	387	387
ECO40-1S4C	355	355	355	394	408	422	422	422
ECO40-2S4C	394	394	394	442	456	470	470	470
ECO40-3S4C	432	432	432	499	509	518	518	518
ECO40-1L4C	480	480	470	547	562	576	576	576
ECO40-2L4C	541	541	541	611	631	650	650	650
ECO40-3L4C	605	605	605	691	709	726	726	726
ECO40-VL4C	662	662	662	797	797	797	797	797
ECO43-1S4	704	704	704	845	845	845	845	845
ECO43-2S4	818	818	818	933	957	982	982	982
ECO43-1M4	902	902	902	1082	1082	1082	1082	1082
ECO43-2M4	1008	1008	920	1133	1180	1227	1227	1227
ECO43-2L4	1144	1144	1144	1304	1338	1373	1373	1373
ECO43-VL4	1232	1232	1232	1478	1478	1478	1478	1478
ECO46-1S4	1300	1300	1300	1470	1520	1560	1560	1560
ECO46-1.5S4	1452	1452	1452	1653	1697	1741	1741	1741
ECO46-2S4	1540	1540	1540	1750	1800	1850	1850	1850
ECO46-1L4	1825	1825	1825	2070	2130	2200	2200	2200
ECO46-1.5L4	2024	2024	2024	2305	2365	2429	2429	2429
ECO46-2L4	2160	2160	2160	2450	2520	2600	2600	2600
ECO46-VL4	2375	2463	2375	2709	2789	2870	2957	2957

For class B rating temperature rises, multiply class H rating by 0,792
For degree of protection IP45 (fitting an air inlet filter and air outlet filter), multiply class H rating by 0,74. For 50°C ambient temperature, multiply class H rating (or class F, or class B) by 0,97.

Application/Limitation

The generators are to be installed and tested in accordance with the Rules.

Name and place of manufacturer

M.E.C.C. ALTE S.P.A. CREAZZO VI, Italy

M.E.C.C. ALTE U.K. Ltd. Oakham, Rutland, United Kingdom

Mecc Alte India PVT LTD, Pune, MAHARASHTRA, INDIA

Type Approval documentation

Drawings:

ECP32 C

Description	Draw. no
Overall dim. Drawing B3B14	B0765_03
Overall dim. Drawing MD35	B0764_03
Shaft Drawing type S-M-L form B3B14	B0671_03
Shaft Drawing type S-M-L form MD35	B0670_03

ECP34 C

Description	Draw. no
Overall dim. Drawing B3B14	B0940_04
Overall dim. Drawing MD35	B0931_04
Shaft Drawing type S-M-L form B3B14	B0886_04
Shaft Drawing type S-M-L form MD35	B0800_04

ECO38 C

Description	Draw. no
Overall dim. Drawing B3B14	B1702_03
Overall dim. Drawing MD35	B1700_03
Shaft Drawing type S-M-L form B3B14	B1452_04
Shaft Drawing type S-M-L form MD35	B1451_01

ECO40 C

Description	
Overall dim. Drawing B3B14	D000047_00
Overall dim. Drawing MD35	D000045_01
Shaft Drawing type S form B3B14	A9449_04
Shaft Drawing type S form MD35	A9446_04
Shaft Drawing type L form B3B14	A9451_04
Shaft Drawing type L form MD35	A9447_05
Shaft Drawing type VL form B3B14	A9451_04
Shaft Drawing type VL form MD35	A9448_04

ECO43 A

Description	Draw. no
Overall dim. drawing form B3/B14	A9502_02
Overall dim. drawing form MD35	A9501_02
Shaft Drawing type S form B3B14	A4052_05
Shaft Drawing type S form MD35	A4049_05
Shaft Drawing type L form B3B14	A4050_05
Shaft Drawing type L form MD35	A4051_05
Shaft Drawing type VL form B3B14	A7916_01

Shaft Drawing type VL form MD35	A9222_00

ECO46 A

Description	Draw. no
Overall dim. drawing form B3/B14	A9504_03
Overall dim. drawing form MD35	A9503_03
Shaft Drawing type S form B3B14	A4641_11
Shaft Drawing type S form MD35	A4643_08
Shaft Drawing type L form B3B14	A4642_11
Shaft Drawing type L form MD35	A4644_08
Shaft Drawing type VL form B3B14	A9373_00
Shaft Drawing type VL form MD35	A9090_00

Test Reports:

Item:	Dated:	No. of pages
ECO 32 2S/4	28-11-05	8
ECP 34 1S/4	28-11-05	8
ECO 38 1SN/4	29-11-05	8
ECO 40 1S/4	05-12-05	9
ECO 43 1SN/4	28-11-05	9
ECO 32 3L/4	28-11-05	9
ECP 34 2L/4	28-11-05	9
ECO 38 3LN/4	01-12-05	8
ECO 40 2L/4	30-11-05	9
ECO 43 2LN/4	30-11-05	9
ECO 46 1L/4	03-03-09	8
ECP32 2M4	18-12-15	9
ECP32 4L4	21-12-15	9
ECP34 3L4	25-05-16	9
ECO38 3L4	09-06-16	9
ECO40 VL4	31-05-16	9
ECO43 1M4	01-06-16	9
ECO43 VL4	13-06-16	9
ECO46 VL4	21-03-16	17

ECO38_2L4C_s.n. V109534
ECP32_1S4C_s.n. V109457
ECP32_2L4_s.n. V099420
Tests ECO40VL4C_2024-01-29_partial tests
Tests ECO40VL4C_2024-02-06_test completed

Tests carried out

Overspeed, high voltage, winding resistance, temperature rise at full load, insulation resistance, overload, short circuit curve, no load test, voltage variation under transient condition tests and excitation voltage.

Marking of product

The products are to be marked with the following specifications:

- Manufacturers name and type designation
- Serial number and year of manufacture
- Voltage, frequency speed
- Power class (kVA) / current
- Winding insulation class
- Degree of protection

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE